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Principles of Agreement Among States On Expectations Regarding Preparations for OCRWM Shipments

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Revision 2

These principles identify the expectations of the states for a fully functioning transportation program for the shipment, storage, and disposal of spent nuclear fuel and high-level radioactive waste.

1. To help ensure the safe and secure transport of shipments under the Nuclear Waste Policy Act, the overall objective of the 180(c) program must be to assist states in developing the capability to help prevent accidents and respond in a timely, appropriate fashion to accidents involving spent fuel and high-level radioactive waste shipments.

2 Funding to states must be predictable to ensure program continuity.

3. Section 180(c) funds and technical assistance must be provided to states at least three years prior to the start of shipments.

4. To maximize the effectiveness of the 180(c) program, the states must know which routes DOE will use prior to applying for assistance. Once routes have been identified, states must have sufficient time (a minimum of three years after routes are identified) to prepare those routes before shipments begin.

5. Scheduling of shipments must be done in a way that balances the priority of shipments established in OCRWM's Annual Capacity Report with impacts on state and local responders. A shipping campaign based on the Annual Capacity Report would result in occasional shipments traveling through many jurisdictions. Consideration needs to be given to the efficient use of federal, state, local, and tribal resources for planning and emergency response in shipment scheduling States will need predictability with regard to shipment scheduling.

6. The 180(c) program must give the states maximum flexibility to implement accident prevention and emergency response programs that best meet their needs. The states, in turn, will be accountable for documenting that the assistance they receive from DOE is, indeed, accomplishing the overall goal of the 180(c) program.

7. DOE must continue to support ~~States support the continued use of~~ the State Regional Groups to ensure consistency and compatibility of shipment planning activities.

8 An upfront planning grant (minimum of $200,000 per state) must be provided to each affected state to cover the costs of planning and conducting a needs assessment. As long as shipments continue, however, there will be an ongoing need for planning. The states must be able to use their annual 180(c) grants for planning as well as for training.

9. DOE and states must develop a list of allowable activities ~~identifying activities~~ that are eligible for funding under Section 180(c), as well as a list of transportation-related activities for which DOE will also provide funding from the Nuclear Waste Fund or other sources

10 DOE must provide the states with fFinancial and technical assistance ~~must be provided to the states~~ for both training and operations activities as long as shipments continue along a shipping corridor

Yucca Mountain Transportation Issues

No Rail Access. At present, there is no railroad access to Yucca Mountain. Construction of a new rail spur would cost more than $1 billion. Even the shortest of the five spur options (99 to 344 miles in length) would be the largest new rail construction project in the United States since World War I. Environmental approvals, right-of-way acquisition, and litigation could delay rail construction for 10 years or more. The alternative to rail spur construction, delivery of thousands of large rail casks by 220-foot-long heavy haul trucks (HHTs) over distances of 112 to 330 miles on Nevada public highways, is probably not feasible. Even if DOE is able to develop rail access to Yucca Mountain, one-third of the reactor sites cannot ship directly by rail.

Mostly Truck Scenario. The DOE "mostly legal-weight truck scenario" is the only national transportation scenario that is currently feasible. All 72 power plant sites and all 5 DOE sites can ship by legal-weight truck. DOE would need 53,000 shipments over 24 years to move 70,000 metric tons of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) to the repository. *If all projected SNF and HLW were shipped to Yucca Mountain, there would be almost 109,000* shipments over 38 years.

Mostly Rail Scenario. DOE's "mostly rail" national scenario would result in fewer cross-country shipments. However, the barge and heavy haul truck shipments from 24 reactor sites that lack rail access, and the heavy haul truck shipments required in Nevada if there is no rail spur to Yucca Mountain, must be added to get a true picture of DOE's "preferred option." When the barge and HHT shipments are included, DOE's "mostly rail" total would be 22,500 shipments over 24 years, and 45,000 over 38 years.

Past & Future Shipments. DOE shipments to Yucca Mountain would greatly exceed past shipments of SNF. Between 1964 and 2001, about 2,600 metric tons of SNF was shipped in the U.S, and there were 3,120 SNF shipments, an average of 69 metric tons and 82 shipments per year. DOE proposes to ship 2,900 metric tons to Yucca Mountain every year for 24 years, requiring 935 to 2,200 shipments per year. Over 38 years, DOE could ship 3,100 metric tons per year, requiring 1,100 to 2,900 shipments per year. Between 1971 and 2001, SNF shipments traveled about 1.6 million miles by truck and 120,000 miles by rail, and there were four accidents involving loaded casks. If DOE shipments have the same accident rate as past shipments, we would expect 160-190 accidents over 38 years, plus 850-2,400 regulatory violations.

Transportation Routes. After concealing potential routes in the Draft EIS, DOE published maps of *"representative routes" in the Final EIS. The DOE maps generally* agree with the routes identified in previous studies by DOE and Nevada contractors. DOE's primary truck route would be I-80 from Cleveland to Salt Lake City. DOE's primary rail route would be the Union Pacific from Chicago to Salt Lake City. With a few exceptions, DOE has identified the most likely highway and rail routes to Nevada. The routes identified by DOE could affect 45 states and the District of Columbia. More than 123 million people currently live in the 703 counties traversed by DOE's highway routes, and 106 million live in counties along DOE's rail routes. DOE predicts that between 10.4 and 16.4 million people will live within one-half mile of a transportation route in 2035.

Spent Nuclear Fuel SNF from commercial power reactors would comprise about 90 percent of the wastes shipped to the repository. Fission products, especially Strontium-90 (half-life 28 years) and Cesium-137 (half-life 30 years), account for most of the radioactivity in SNF for the first hundred years after removal from reactors, and are a major source of intense gamma and neutron radiation. After one-year in a water-filled storage pool, unshielded SNF is so radioactive that it

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delivers a lethal dose of radiation (600 rem) in about 10 seconds. After 50 years of cooling, the total radioactivity (measured in curies) and the surface dose rate (measured in rem/hour) decline by more than 95 percent, but SNF can still deliver a lethal radiation exposure in less than 5 minutes after 50 years.

Cask Contents. The 70,000 metric tons of SNF and HLW shipped to Yucca Mountain during the first 24 years would contain more than 12 billion curies total radioactivity, including 4.8 billion curies of deadly Cesium-137, and 25 million curies of Plutonium-239, which has a half-life of 24,000 years. The average truck cask of commercial SNF would contain more than 350,000 curies, including 20-30 times the amount of radioactive cesium and strontium released by the Hiroshima bomb. Each rail cask of spent fuel from a commercial nuclear power plant would contain more than 2 million curies total radioactivity. Four rail casks would contain more Cesium-137 than the total amount released during the Chernobyl accident (2.4-2.9 million curies).

Accident Consequences. Highway and rail accidents severe enough to release radioactive materials from a shipping cask have a very low probability of occurrence, but such accidents are credible. A Nevada-sponsored study of the July 2001 Baltimore rail tunnel fire concluded that it would have resulted in significant release of radioactive materials. It burned for more than three days with temperatures as high as 1500°F. A single rail cask in such an accident could have released enough radioactive cesium to contaminate an area of 32 square miles. Failure to cleanup the contamination, at a cost of $13.7 billion, would cause 4,000 to 28,000 cancer deaths over the next 50 years.

Terrorism Consequences. DOE and NRC testing in the 1980s demonstrated that a military demolition charge could breach the wall of a truck cask. An industry test in 1998 demonstrated that a TOW missile warhead could breach a rail cask. DOE acknowledges that a successful attack on a truck cask in an urban area would result in 48 latent cancer fatalities. A Nevada-sponsored evaluation of the same scenario concluded the attack on a truck cask using a common military demolition device could cause 300 to 1,800 latent cancer fatalities, assuming 90% penetration by a single blast. Full perforation of the cask, likely to occur in an attack involving a state-of-the art anti-tank weapon, such as the TOW missile, could cause 3,000 to 18,000 latent cancer fatalities. Cleanup and recovery costs would exceed $10 billion.

Dedicated Trains. Current USDOT regulations allow shipment of spent fuel casks in mixed freight trains carrying other hazardous materials. Nevada believes spent fuel should never be shipped in mixed freight trains, and that spent fuel should always be shipped in dedicated (sole-use) trains, operating under strict speed limits and special passing rules, as recommended by the Association of American Railroads. DOE and the nuclear industry oppose mandatory use of dedicated trains and special safety rules.

Full-Scale Testing. The NRC does not currently require full-scale physical testing of shipping casks. None of the SNF shipping casks currently used in the United States have ever been tested full-scale. This fact was confirmed by NRC Chairman Richard Meserve in letters to Senator Harry Reid dated April 2, 2002 and April 24, 2002. DOE has no plans for full-scale testing of the casks which would be used for shipments to Yucca Mountain. DOE and the nuclear industry oppose mandatory full-scale testing.